CALIFORNIA INSTITUTE OF TECHNOLOGY

PASADENA

Robert A. Millikan

B. L. J. Jr. No. 107-

October, 1929-

2 4/5 0
2 50

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

NORMAN BRIDGE LABORATORY OF PHYSICS

July 20th, 1931

Mrs. George M. Millard,
645 Prospect Crescent,
Pasadena, California

Dear Mrs. Millard:

I am enclosing to you herewith, the manuscript of my remarks at the Einstein dinner, which I hope will serve your purpose.

I have received and looked over the superb edition of "Marcus Aurelius" and wish you to know how greatly I appreciate your thoughtfulness and friendliness in presenting it to me.

I shall prize it as one of my choicest possessions.

Very sincerely yours,

Robert A. Millikan

RAM:VH
Enc.

Robert A. Millikan

Chur 94

12/1 (

MILLIKAN, R. LS 11-10-36

15¢ paid

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

NORMAN BRIDGE LABORATORY OF PHYSICS

November 10, 1936

Mr. George N. Cole

23 Lexington Avenue

New York City

My dear Mr. Cole:

I am writing to acknowledge receipt of your letter of November 4th. It seems to me that you are struggling, in the way in which we have all been struggling for fifteen years, in trying to reconcile the apparent contradictions of the wave theory and the dart theory of light. You find the evidence for the wave theory completely convincing, and so do all the rest of us. So far as I can see, your shells are merely the wave fronts of the wave theory, and all the results that you find in your analysis involve the wave concept. The evidence for these waves is so stupendous that we have got to retain them, as you desire to do. At the same time, the evidence for the darts is so convincing that we have got to find some way to keep both the wave theory and the dart theory and find a way out of their contradictions. This is a very difficult matter in which we have not succeeded as yet very fully. You will find the whole matter discussed in a more careful way in my book published by the University of Chicago Press last year entitled "Electrons (+ and -), Protons, Photons, Neutr ns, and Cosmic Rays". So far as I can see,

55

your letters present no difficulties that are more difficult than you will find discussed fully there, especially in the last half of the book. It contains all that I have to say at present. I assume that you can get it in any library.

Very sincerely yours,

RAM:IH

R. A. Millikan

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

NORMAN BRIDGE LABORATORY OF PHYSICS

November 17, 1923

Dr. M. I. Pupin,

Columbia University,

New York City.

Dear Dr. Pupin:

It was mighty nice of you to send me the telegram which I have just received. If the award was at all deserved, which I doubt, it was due to the man who first taught me in 1893 what real physics was. I am not saying this to flatter him, for I have said it to many others before you heard it.

Cordially yours,

R. A. Millikan

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

NORMAN BRIDGE LABORATORY OF PHYSICS

Robert A. Millikan's introductory remarks at the Einstein dinner held at the Athenaeum California Institute January 15th, 1931.

The distinguishing feature of modern scientific thought lies in the fact that it begins by discarding all a priori conceptions about the nature of reality — or about the ultimate nature of the universe — such as had characterized practically all Greek philosophy and all medieval thinking as well, and takes instead, as its starting point, well-authenticated, carefully tested, experimental facts, no matter whether these facts seem at the moment to fit into any general philosophical scheme or not — that is no matter whether they seem at the moment to be reasonable or not. In a word modern science is essentially empirical, and no one has done more to make it so than the theoretical physicist Albert Einstein. That, in a sentence is, I take it, his greatest contribution to modern thought. It will stand out repeatedly in all that is said tonight.

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

NORMAN BRIDGE LABORATORY OF PHYSICS

Throughout the nineteenth century we had been
building up what seemed a wonderfully consistent
"natural philosophy" as to the nature of radiant energy
— a beautiful wave theory of light. Professor
Michelsons own researches on interference had
furnished some of its strongest supports. This
theory required that it be possible, by noting the
difference in time required for a beam of light
to get back to the observer when, on the one hand,
it was sent forth in the derection of the earths
motion and back by reflection from a mirror to the
observer, and when on the other hand it was
sent a like distance forth and back at right angles
to the earths motion, to find the speed with which
the earth is moving through the ether. But this
experiment, when performed with extraordinary
skill and refinement by Michelson and Morley in 1887

yielded, with great definiteness, the answer that there is no such time-difference and therefore no observable velocity of the earth with respect to the ether. That unreasonable, apparently inexplicable, experimental fact has now been checked by a multitude of observers — very recently and very carefully by Michelson himself, and also in extraordinarily exact measurements by Roy J. Kennedy at the California Institute, so that it is now a well-authenticated fact.

For twenty years after this fact came to light physicists wandered in the wilderness in the disheartening effort to make it seem reasonable. Then Einstein called out to us all. "Let us merely accept this as an established experimental fact and proceed to work out its inevitable consequences", and he went at that task himself with an energy and a capacity which very few people on earth possess

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

NORMAN BRIDGE LABORATORY OF PHYSICS

Thus was born the special theory of relativity, and I now wish to introduce the man who laid its experimental foundations, Professor Albert A. Michelson, my own chief and adviser and friend for twenty five years at the University of Chicago, the man who gave me my own opportunity in physics, and by his own example, — the greatest of stimulants — showed me how to use it.

BURNDY LIBRARY • NORWALK, CONN.

Autograph manuscript by Robert Millikan, Nobel Laureate in Physics, introducing ~~Dr. Einstein~~ Prof. Michelson at the California Institute of Technology in 1931.

NO

320 **Millikan, R. A.** Noted physicist. L.s. ½ p., 4to. Pasadena, November 17, 1923. To Michael I. Pupin, "... the man who first taught me in 1893 what real physics was." Written upon receipt of Pupin's congratulations on winning the Nobel Prize. BRNEC 16-65 $25

(William?) Houston written on the verso of a House of Assembly resolution dated Sept. 21, 1780, extracted from the minutes by Maskell Ewing, Jr., Clerk of the House, ordering the contractors of Hunterdon, Burlington, Salem, Cumberland and Sussex to deliver all "Beeves ... fit to kill ..." Morris gives an ac-